



iu-99.ST25.txt  
SEQUENCE LISTING

<110> Indiana University Research and Technology Center  
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Tsai, Shih-Chong

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<140> 10/080,943

<141> 2002-02-22

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Lys His Leu Asp Phe Asp Ser Arg Cys Ala Leu Leu Ala Leu Phe Ala  
210 215 220

Gln Ala Thr Leu Thr Glu His Pro Met Ser Phe Glu Gly Val Gln Leu  
225 230 235 240

Pro Gln Val Pro Gly Arg Leu Leu Phe Ser Leu Val Lys Arg Tyr Leu  
245 250 255

His Val Thr Phe Leu Leu Asp Arg Leu Asn Gly Asp Ala Gly Asp Gln  
260 265 270

Gly Ala Gln Asn Asn Phe Ser Pro Glu Glu Leu Asn Val Gly Arg Gly  
275 280 285

Arg Leu Glu Leu Glu Phe Ser Met Ala Met Gly Thr Leu Ile Ser Glu  
290 295 300

Leu Val Gln Ala Met Arg Trp Asp Gly Ala Ser Ser Arg Pro Glu Ser  
305 310 315 320

Ser Ser Ser Ser Thr Phe Gln Pro Arg Pro Ala Gln Phe Arg Pro Tyr  
325 330 335

Thr Gln Arg Phe Arg Arg Ser Arg Arg Phe Arg Pro Arg Ala Ser Phe

340

345

350

Ala Ser Phe Asn Thr Tyr Ala Leu Tyr Val Arg Asp Thr Leu Arg Pro  
 355 360 365

Gly Met Arg Val Arg Met Leu Glu Asn Tyr Glu Glu Ile Ala Ala Gly  
 370 375 380

Asp Glu Gly Gln Phe Arg Gln Ser Asn Asp Gly Val Pro Pro Ala Gln  
 385 390 395 400

Val Leu Trp Asp Ser Thr Gly His Thr Tyr Trp Val His Trp His Met  
 405 410 415

Leu Glu Ile Leu Gly Phe Glu Glu Asp Ile Glu Asp Val Ile Asp Ile  
 420 425 430

Glu Glu Leu Gln Glu Leu Gly Ala Asn Gly Ala Leu Ser Ile Val Pro  
 435 440 445

Pro Ser Gln Arg Trp Lys Pro Ile Thr Gln Leu Phe Ala Glu Pro Tyr  
 450 455 460

Val Val Pro Glu Glu Glu Asp Arg Glu Glu Ser Glu Asn Leu Thr Gln  
 465 470 475 480

Ala Glu Trp Trp Glu Leu Leu Phe Phe Ile Arg Gln Leu Ser Glu Ala  
 485 490 495

Glu Arg Leu His Ile Val Asp Leu Leu Gln Asp His Leu Glu Glu Glu  
 500 505 510

Arg Val Leu Asp Tyr Asp Met Leu Pro Glu Leu Thr Val Pro Val Asp  
 515 520 525

Leu Ala Gln Asp Leu Leu Leu Ser Leu Pro Gln Gln Leu Glu Asp Ser  
 530 535 540

Ala Leu Arg Asp Leu Phe Ser Cys Ser Val Tyr Arg Lys Tyr Gly Pro  
 545 550 555 560

Glu Val Leu Val Gly His Leu Ser Tyr Pro Phe Val Pro Gly Ala Gln  
 565 570 575

Pro Asn Leu Phe Gly Ala Asn Glu Glu Ser Glu Ala Lys Asp Pro Pro  
 580 585 590

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Leu Gln Ser Ala Ser Pro Ala Leu Gln Arg Leu Val Glu Ser Leu Gly  
595 600 605

Pro Glu Gly Glu Val Leu Val Glu Leu Glu Gln Ala Leu Gly Ser Glu  
610 615 620

Ala Pro Gln Glu Thr Glu Val Lys Ser Cys Leu Leu Gln Leu Gln Glu  
625 630 635 640

Gln Pro Gln Pro Phe Leu Ala Leu Met Arg Ser Leu Asp Thr Ser Ala  
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Ser Asn Lys Thr Leu His Leu Thr Val Leu Arg Ile Leu Met Gln Leu  
660 665 670

Val Asn Phe Pro Glu Ala Leu Leu Leu Pro Trp His Glu Ala Met Asp  
675 680 685

Ala Cys Val Thr Cys Leu Arg Ser Pro Asn Thr Asp Arg Glu Val Leu  
690 695 700

Gln Glu Leu Ile Phe Phe Leu His Arg Leu Thr Thr Thr Ser Arg Asp  
705 710 715 720

Tyr Ala Val Ile Leu Asn Gln His Gly Ala Arg Asp Ala Ile Ser Lys  
725 730 735

Val Leu Glu Lys His Arg Gly Lys Leu Glu Leu Ala Gln Glu Leu Arg  
740 745 750

Asp Met Val Ser Lys Cys Glu Lys His Ala His Leu Tyr Arg Lys Leu  
755 760 765

Thr Thr Asn Ile Leu Gly Gly Cys Ile Gln Met Val Leu Gly Gln Ile  
770 775 780

Glu Asp His Arg Arg Thr His Arg Pro Ile Gln Ile Pro Phe Phe Asp  
785 790 795 800

Val Phe Leu Arg Tyr Leu Cys Gln Gly Ser Ser Glu Glu Met Lys Lys  
805 810 815

Asn Arg Tyr Trp Glu Lys Val Glu Val Ser Ser Asn Pro Gln Arg Ala  
820 825 830

Ser Arg Leu Thr Asp Arg Asn Pro Lys Thr Tyr Trp Glu Ser Ser Gly  
835 840 845

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Arg Ala Gly Ser His Phe Ile Thr Leu His Met Arg Pro Gly Val Ile  
850 855 860

Ile Arg Gln Leu Thr Leu Leu Val Ala Gly Glu Asp Ser Ser Tyr Met  
865 870 875 880

Pro Ala Trp Val Val Val Cys Gly Gly Asn Ser Ile Lys Ser Val Asn  
885 890 895

Lys Glu Leu Asn Thr Val Asn Val Met Pro Ser Ala Ser Arg Val Thr  
900 905 910

Leu Leu Glu Asn Leu Thr Arg Phe Trp Pro Ile Ile Gln Ile Arg Ile  
915 920 925

Lys Arg Cys Gln Gln Gly Gly Ile Asn Thr Arg Ile Arg Gly Leu Glu  
930 935 940

Val Leu Gly Pro Lys Pro Thr Phe Trp Pro Val Phe Arg Glu Gln Leu  
945 950 955 960

Cys Arg His Thr Arg Leu Phe Tyr Met Val Arg Ala Gln Ala Trp Ser  
965 970 975

Gln Asp Ile Ala Glu Asp Arg Arg Ser Leu Leu His Leu Ser Ser Arg  
980 985 990

Leu Asn Gly Ala Leu Arg His Glu Gln Asn Phe Ala Glu Arg Phe Leu  
995 1000 1005

Pro Asp Met Glu Ala Ala Gln Ala Leu Ser Lys Thr Cys Trp Glu  
1010 1015 1020

Ala Leu Val Ser Pro Leu Val Gln Asn Ile Thr Ser Pro Asp Glu  
1025 1030 1035

Asp Ser Thr Ser Ser Leu Gly Trp Leu Leu Asp Gln Tyr Leu Gly  
1040 1045 1050

Cys Arg Glu Ala Ala Tyr Asn Pro Gln Ser Arg Ala Ala Ala Phe  
1055 1060 1065

Ser Ser Arg Val Arg Arg Leu Thr His Leu Leu Val His Val Glu  
1070 1075 1080

Pro Arg Glu Ala Ala Pro Pro Val Val Ala Ile Pro Arg Ser Lys  
1085 1090 1095

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Gly	Arg	Asn	Arg	Ile	His	Asp	Trp	Ser	Tyr	Leu	Ile	Thr	Arg	Gly
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Leu	Pro	Ser	Ser	Ile	Met	Lys	Asn	Leu	Thr	Arg	Cys	Trp	Arg	Ser
	1115					1120					1125			
Val	Val	Glu	Glu	Gln	Met	Asn	Lys	Phe	Leu	Ser	Ala	Ser	Trp	Lys
	1130					1135					1140			
Asp	Asp	Asp	Phe	Val	Pro	Arg	Tyr	Cys	Glu	Arg	Tyr	Tyr	Val	Leu
	1145					1150					1155			
Gln	Lys	Ser	Ser	Ser	Glu	Leu	Phe	Gly	Pro	Arg	Ala	Ala	Phe	Leu
	1160					1165					1170			
Leu	Ala	Met	Arg	Asn	Gly	Cys	Ala	Asp	Ala	Val	Arg	Arg	Leu	Pro
	1175					1180					1185			
Phe	Leu	Arg	Ala	Ala	His	Val	Lys	Gln	Gln	Phe	Ala	Arg	His	Ile
	1190					1195					1200			
Asp	Gln	Arg	Ile	Gln	Gly	Ser	Arg	Met	Gly	Gly	Ala	Arg	Gly	Met
	1205					1210					1215			
Glu	Met	Leu	Ala	Gln	Leu	Gln	Arg	Cys	Leu	Glu	Ser	Val	Leu	Ile
	1220					1225					1230			
Phe	Ser	Pro	Leu	Glu	Ile	Ala	Thr	Thr	Phe	Glu	His	Tyr	Tyr	Gln
	1235					1240					1245			
His	Tyr	Met	Ala	Asp	Arg	Leu	Leu	Ser	Val	Gly	Ser	Ser	Trp	Leu
	1250					1255					1260			
Glu	Gly	Ala	Val	Leu	Glu	Gln	Ile	Gly	Pro	Cys	Phe	Pro	Ser	Arg
	1265					1270					1275			
Leu	Pro	Gln	Gln	Met	Leu	Gln	Ser	Leu	Asn	Val	Ser	Glu	Glu	Leu
	1280					1285					1290			
Gln	Arg	Gln	Phe	His	Val	Tyr	Gln	Leu	Gln	Gln	Leu	Asp	Gln	Glu
	1295					1300					1305			
Leu	Leu	Lys	Leu	Glu	Asp	Thr	Glu	Lys	Lys	Ile	Gln	Val	Ala	His
	1310					1315					1320			
Glu	Asp	Ser	Gly	Arg	Glu	Asp	Lys	Ser	Lys	Lys	Glu	Glu	Ala	Ile

1325		1330	
Gly Glu Ala Ala Ala Val	Ala Met Ala Glu Glu Glu Asp Gln Gly		
1340	1345	1350	
Lys Lys Glu Glu Gly Glu	Glu Gly Glu Gly Glu Asp Glu Glu		
1355	1360	1365	
Glu Glu Arg Tyr Tyr Lys	Gly Thr Met Pro Glu Val Cys Val Leu		
1370	1375	1380	
Val Val Thr Pro Arg Phe	Trp Pro Val Ala Ser Val Cys Gln Met		
1385	1390	1395	
Leu Asn Pro Ala Thr Cys	Leu Pro Ala Tyr Leu Arg Gly Thr Ile		
1400	1405	1410	
Asn His Tyr Thr Asn Phe	Tyr Ser Lys Ser Gln Ser Arg Ser Ser		
1415	1420	1425	
Leu Glu Lys Glu Pro Gln	Arg Arg Leu Gln Trp Thr Trp Gln Gly		
1430	1435	1440	
Arg Ala Glu Val Gln Phe	Gly Gly Gln Ile Leu His Val Ser Thr		
1445	1450	1455	
Val Gln Met Trp Leu Leu	Leu His Leu Asn Asn Gln Lys Glu Val		
1460	1465	1470	
Ser Val Glu Ser Leu Gln	Ala Ile Ser Glu Leu Pro Pro Asp Val		
1475	1480	1485	
Leu His Arg Ala Ile Gly	Pro Leu Thr Ser Ser Arg Gly Pro Leu		
1490	1495	1500	
Asp Leu Gln Glu Gln Lys	Asn Val Pro Gly Gly Val Leu Lys Ile		
1505	1510	1515	
Arg Asp Asp Ser Glu Glu	Pro Arg Pro Arg Arg Gly Asn Val Trp		
1520	1525	1530	
Leu Ile Pro Pro Gln Thr	Tyr Leu Gln Ala Glu Ala Glu Glu Gly		
1535	1540	1545	
Arg Asn Met Glu Lys Arg	Arg Asn Leu Leu Asn Cys Leu Val Val		
1550	1555	1560	

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Arg Ile Leu Lys Ala His Gly Asp Glu Gly Leu His Val Asp Arg  
 1565 1570 1575

Leu Val Tyr Leu Val Leu Glu Ala Trp Glu Lys Gly Pro Cys Pro  
 1580 1585 1590

Ala Arg Gly Leu Val Ser Ser Leu Gly Arg Gly Ala Thr Cys Arg  
 1595 1600 1605

Ser Ser Asp Val Leu Ser Cys Ile Leu His Leu Leu Val Lys Gly  
 1610 1615 1620

Thr Leu Arg Arg His Asp Asp Arg Pro Gln Val Leu Tyr Tyr Ala  
 1625 1630 1635

Val Pro Val Thr Val Met Glu Pro His Met Glu Ser Leu Asn Pro  
 1640 1645 1650

Gly Ser Ala Gly Pro Asn Pro Pro Leu Thr Phe His Thr Leu Gln  
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Thr Phe Ser Thr Phe Arg  
 1685

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 <222> (87)..(5183)

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 Met Val Gly Glu Leu Arg Tyr Arg Glu  
 1 5

ttc agg gtg ccc ctg ggg ccc ggc tta cat gcc tat cct gat gag ctg 161  
 Phe Arg Val Pro Leu Gly Pro Gly Leu His Ala Tyr Pro Asp Glu Leu  
 10 15 20 25

atc cgc cag cgc gtg ggc cat gat ggg cat cct gag tac cag atc cgt 209  
 Ile Arg Gln Arg Val Gly His Asp Gly His Pro Glu Tyr Gln Ile Arg  
 30 35 40

tgg ctc atc ctg cgg cgt ggc gat gag ggg gac ggg ggc tct ggc caa 257  
 Trp Leu Ile Leu Arg Arg Gly Asp Glu Gly Asp Gly Gly Ser Gly Gln

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45	50	55	
gtg gac tgc aag gct gag cac atc ctg ctg tgg atg tcc aag gat gag Val Asp Cys Lys Ala Glu His Ile Leu Leu Trp Met Ser Lys Asp Glu 60 65 70			305
atc tat gcc aac tgc cac aag atg ctg ggc gag gat ggc cag gtc atc Ile Tyr Ala Asn Cys His Lys Met Leu Gly Glu Asp Gly Gln Val Ile 75 80 85			353
ggg ccc tcc cag gag tct gca ggg gag gtt ggg gcc ctg gac aaa tct Gly Pro Ser Gln Glu Ser Ala Gly Glu Val Gly Ala Leu Asp Lys Ser 90 95 100 105			401
gtg ctg gag gag atg gaa acc gat gtg aag tcc ctc att cag aga gcc Val Leu Glu Glu Met Glu Thr Asp Val Lys Ser Leu Ile Gln Arg Ala 110 115 120			449
ctt cgg cag ctg gag gag tgt gtg ggc act atc cct cct gct cct cta Leu Arg Gln Leu Glu Glu Cys Val Gly Thr Ile Pro Pro Ala Pro Leu 125 130 135			497
ctt cac act gtc cac gtg ctc agc gcc tat gcc agc att gag ccc ctc Leu His Thr Val His Val Leu Ser Ala Tyr Ala Ser Ile Glu Pro Leu 140 145 150			545
act gga gta ttc aag gac cca agg gtc ctg gac ttg ctc atg cac atg Thr Gly Val Phe Lys Asp Pro Arg Val Leu Asp Leu Leu Met His Met 155 160 165			593
ttg agt agt cct gat tat cag att cgc tgg agt gca ggc cgg atg ata Leu Ser Ser Pro Asp Tyr Gln Ile Arg Trp Ser Ala Gly Arg Met Ile 170 175 180 185			641
caa gcc ctg tcc tcc cat gac gct ggg acc cgg act cag atc ctt ctg Gln Ala Leu Ser Ser His Asp Ala Gly Thr Arg Thr Gln Ile Leu Leu 190 195 200			689
tca ctg agc caa caa gaa gcc att gag aaa cac ctg gat ttt gac agc Ser Leu Ser Gln Gln Glu Ala Ile Glu Lys His Leu Asp Phe Asp Ser 205 210 215			737
cgc tgt gct ctg cta gca ctg ttt gca cag gcc acg ctc tct gaa cac Arg Cys Ala Leu Leu Ala Leu Phe Ala Gln Ala Thr Leu Ser Glu His 220 225 230			785
ccc atg tct ttc gag ggc att cag cta cca cag gtc cca gga agg gtg Pro Met Ser Phe Glu Gly Ile Gln Leu Pro Gln Val Pro Gly Arg Val 235 240 245			833
ctc ttc tcc ctg gtg aag cgg tat ttg cat gtc acc tcg ctc ctg gat Leu Phe Ser Leu Val Lys Arg Tyr Leu His Val Thr Ser Leu Leu Asp 250 255 260 265			881
cag ctg aac gac agt gct gcg gag cca gga gcc cag aac acc tct gct Gln Leu Asn Asp Ser Ala Ala Glu Pro Gly Ala Gln Asn Thr Ser Ala 270 275 280			929
cct gag gag ttg agt ggg gag agg ggt caa ctg gag ctg gag ttc agt Pro Glu Glu Leu Ser Gly Glu Arg Gly Gln Leu Glu Leu Glu Phe Ser 285 290 295			977
atg gcc atg ggc acc ctg atc tcg gag ctg gtg caa gcc atg cgc tgg			1025



iu-99.ST25.txt

Met	Ala	Met 300	Gly	Thr	Leu	Ile	Ser 305	Glu	Leu	Val	Gln	Ala 310	Met	Arg	Trp	
gac Asp	cag Gln 315	gcc Ala	tca Ser	gac Asp	aga Arg	cca Pro 320	agg Arg	agc Ser	tca Ser	gca Ala	cgg Arg 325	tcc Ser	ccc Pro	ggt Gly	tcc Ser	1073
atc Ile 330	ttc Phe	cag Gln	cct Pro	cag Gln	ctg Leu 335	gca Ala	gat Asp	gtg Val	agc Ser	cca Pro 340	ggg Gly	ctc Leu	ccc Pro	gct Ala	gcc Ala 345	1121
cag Gln	gct Ala	cag Gln	ccc Pro	tcc Ser 350	ttc Phe	agg Arg	agg Arg	tca Ser	aga Arg 355	cgt Arg	ttt Phe	cgc Arg	cct Pro	cgt Arg 360	tct Ser	1169
gag Glu	ttc Phe	gca Ala	agt Ser 365	ggc Gly	aat Asn	acc Thr	tat Tyr	gct Ala 370	ttg Leu	tat Tyr	gtg Val	cgg Arg	gac Asp 375	aca Thr	ctg Leu	1217
cag Gln	ccg Pro	ggg Gly 380	atg Met	cga Arg	gtg Val	cgg Arg	atg Met 385	ctg Leu	gat Asp	gat Asp	tat Tyr	gag Glu 390	gag Glu	atc Ile	agt Ser	1265
gcc Ala	ggg Gly 395	gat Asp	gag Glu	ggc Gly	gag Glu	ttt Phe 400	cgg Arg	cag Gln	agc Ser	aac Asn	aac Asn 405	ggt Gly	gtg Val	cct Pro	cct Pro	1313
gtg Val 410	cag Gln	gta Val	ttt Phe	tgg Trp	gag Glu 415	tca Ser	aca Thr	ggc Gly	cgc Arg	acc Thr 420	tat Tyr	tgg Trp	gtg Val	cac His	tgg Trp 425	1361
cac His	atg Met	ctg Leu	gag Glu	atc Ile 430	ttg Leu	ggc Gly	ttt Phe	gag Glu	gaa Glu 435	gac Asp	att Ile	gag Glu	gac Asp	atg Met 440	gtt Val	1409
gag Glu	gct Ala	gat Asp	gag Glu 445	tac Tyr	caa Gln	ggg Gly	gca Ala	gtg Val 450	gcc Ala	agt Ser	aga Arg	gtc Val	ctg Leu 455	ggt Gly	aga Arg	1457
gcc Ala	ctg Leu	cct Pro 460	gcc Ala	tgg Trp	cgc Arg	tgg Trp	agg Arg 465	ccc Pro	atg Met	aca Thr	gaa Glu	ctc Leu 470	tat Tyr	gct Ala	gtg Val	1505
cct Pro	tat Tyr 475	gtg Val	ctg Leu	cct Pro	gag Glu	gat Asp 480	gag Glu	gac Asp	act Thr	gag Glu	gag Glu 485	tgt Cys	gaa Glu	cac His	ctg Leu	1553
acc Thr 490	ctg Leu	gct Ala	gag Glu	tgg Trp	tgg Trp 495	gaa Glu	ctc Leu	ctc Leu	ttc Phe	ttc Phe 500	atc Ile	aag Lys	aag Lys	ctg Leu	gat Asp 505	1601
gga Gly	cct Pro	gac Asp	cat His	cag Gln 510	gag Glu	gtt Val	ctc Leu	cag Gln	atc Ile 515	ctc Leu	cag Gln	gag Glu	aac Asn	cta Leu 520	gat Asp	1649
ggg Gly	gag Glu	att Ile	ctg Leu 525	gat Asp	gat Asp	gag Glu	atc Ile	cta Leu 530	gct Ala	gaa Glu	ctg Leu	gcc Ala	gtg Val 535	ccc Pro	ata Ile	1697
gaa Glu	ttg Leu	gcc Ala 540	cag Gln	gac Asp	ttg Leu	ctg Leu	ctg Leu 545	act Thr	ctg Leu	cca Pro	cag Gln	cga Arg 550	ctc Leu	aat Asn	gac Asp	1745

## iu-99.ST25.txt

agt Ser	gcc Ala 555	ctc Leu	agg Arg	gac Asp	ctg Leu	atc Ile 560	aac Asn	tgc Cys	cat His	gtc Val 565	tac Tyr	aag Lys	aag Lys	tat Tyr	ggg Gly	1793
cct Pro 570	gaa Glu	gcc Ala	cta Leu	gca Ala	ggg Gly 575	aac Asn	caa Gln	gcc Ala	tac Tyr	cca Pro 580	tcc Ser	ctt Leu	cta Leu	gaa Glu	gcc Ala 585	1841
caa Gln	gaa Glu	gat Asp	gtc Val	ctc Leu 590	ctg Leu	cta Leu	gac Asp	gcg Ala	cag Gln 595	gcc Ala	cag Gln	gct Ala	aag Lys	gac Asp 600	tca Ser	1889
gaa Glu	gat Asp	gca Ala	gcc Ala 605	aaa Lys	gtg Val	gaa Glu	gca Ala	aaa Lys 610	gaa Glu	ccc Pro	cca Pro	tct Ser	cag Gln 615	agt Ser	ccc Pro	1937
aac Asn	act Thr	ccc Pro 620	ctg Leu	cag Gln	cgt Arg	ctg Leu	gtg Val 625	gag Glu	ggg Gly	tat Tyr	ggg Gly	cca Pro 630	gct Ala	ggg Gly	aaa Lys	1985
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aac Asn 650	aag Lys	gtc Val	aag Lys	cca Pro	ctc Leu 655	ctg Leu	ctg Leu	cag Gln	ctg Leu	cag Gln 660	cgg Arg	cag Gln	ccg Pro	cag Gln	ccc Pro 665	2081
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cac His	ctg Leu	gga Gly 765	aag Lys	ctg Leu	gag Glu	ctg Leu	gct Ala	cag Gln 770	gag Glu	ctg Leu	cgg Arg	gac Asp	atg Met 775	gtg Val	ttc Phe	2417
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ctg Leu	gga Gly 795	ggc Gly	tgc Cys	atc Ile	cag Gln	atg Met 800	gtg Val	ctg Leu	ggc Gly	cag Gln	atc Ile 805	gaa Glu	gac Asp	cac His	aga Arg	2513

iu-99.ST25.txt

cga Arg 810	acc Thr	cac His	cgg Arg	ccc Pro	atc Ile 815	aac Asn	atc Ile	cct Pro	ttc Phe	ttt Phe 820	gat Asp	gtg Val	ttc Phe	ctc Leu	aga Arg 825	2561
tac Tyr	ctg Leu	tgc Cys	cag Gln	ggc Gly 830	tcc Ser	agt Ser	gtg Val	gaa Glu	gtg Val 835	aag Lys	gag Glu	gac Asp	aag Lys	tgc Cys 840	tgg Trp	2609
gag Glu	aag Lys	gtg Val	gag Glu 845	gtg Val	tcc Ser	tcc Ser	aac Asn	ccg Pro 850	cac His	cgg Arg	gcc Ala	agc Ser	aag Lys 855	ctg Leu	acg Thr	2657
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cac His	tac Tyr 875	atc Ile	acc Thr	ctg Leu	cac His	atg Met 880	cgc Arg	cgg Arg	ggc Gly	atc Ile	ctc Leu 885	atc Ile	agg Arg	caa Gln	ctg Leu	2753
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aag Lys 970	ccc Pro	acg Thr	ttc Phe	tgg Trp	cca Pro 975	gtg Val	ttc Phe	cgg Arg	gag Glu	cag Gln 980	ctc Leu	tgt Cys	cgt Arg	cac His	aca Thr 985	3041
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gag Glu	gac Asp	cgc Arg	agg Arg 1005	agc Ser	ctc Leu	ctg Leu	cac His	ctg Leu 1010	agt Ser	tct Ser	aga Arg	ctc Leu	aac Asn 1015	ggt Gly		3134
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gtc Val	agc Ser	ccc Pro	gtg Val	gtg Val	cag Gln	aac Asn	atc Ile	acc Thr	tcc Ser	cct Pro	gat Asp	gag Glu	gat Asp	ggc Gly		3269

iu-99.ST25.txt															
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Ile	Ser	Pro	Leu	Gly	Trp	Leu	Leu	Asp	Gln	Tyr	Leu	Glu	Cys	Gln	
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Glu	Ala	Val	Phe	Asn	Pro	Gln	Ser	Arg	Gly	Pro	Ala	Phe	Phe	Ser	
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Arg	Val	Arg	Arg	Leu	Thr	His	Leu	Leu	Val	His	Val	Glu	Pro	Cys	
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Glu	Ala	Pro	Pro	Pro	Val	Val	Ala	Thr	Pro	Arg	Pro	Lys	Gly	Arg	
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Asn	Arg	Ser	His	Asp	Trp	Ser	Ser	Leu	Ala	Thr	Arg	Gly	Leu	Pro	
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Ser	Ser	Ile	Met	Arg	Asn	Leu	Thr	Arg	Cys	Trp	Arg	Ala	Val	Val	
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Glu	Lys	Gln	Val	Asn	Asn	Phe	Leu	Thr	Ser	Ser	Trp	Arg	Asp	Asp	
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Asp	Phe	Val	Pro	Arg	Tyr	Cys	Glu	His	Phe	Asn	Ile	Leu	Gln	Asn	
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tca	agc	tct	gaa	ctg	ttt	ggg	cct	cgg	gca	gcc	ttc	ttg	ctg	gcg	3674
Ser	Ser	Ser	Glu	Leu	Phe	Gly	Pro	Arg	Ala	Ala	Phe	Leu	Leu	Ala	
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ctg	caa	aat	ggc	tgt	gcg	gga	gcc	ttg	ctg	aag	ctc	cct	ttt	ctc	3719
Leu	Gln	Asn	Gly	Cys	Ala	Gly	Ala	Leu	Leu	Lys	Leu	Pro	Phe	Leu	
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aaa	gct	gcc	cac	gtg	agt	gag	cag	ttc	gcc	cgg	cac	att	gac	cag	3764
Lys	Ala	Ala	His	Val	Ser	Glu	Gln	Phe	Ala	Arg	His	Ile	Asp	Gln	
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cag	atc	cag	ggc	agc	cgg	atc	ggt	gga	gcc	cag	gaa	atg	gag	agg	3809
Gln	Ile	Gln	Gly	Ser	Arg	Ile	Gly	Gly	Ala	Gln	Glu	Met	Glu	Arg	
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Leu	Ala	Gln	Leu	Gln	Gln	Cys	Leu	Gln	Ala	Val	Leu	Ile	Phe	Ser	
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Gly	Leu	Glu	Ile	Ala	Thr	Thr	Phe	Glu	His	Tyr	Tyr	Gln	His	Tyr	
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Ala	Val	Leu	Glu	Gln	Ile	Gly	Pro	Cys	Phe	Pro	Asn	Arg	Leu	Pro	
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Gln	Gln	Met	Leu	Gln	Ser	Leu	Ser	Thr	Ser	Lys	Glu	Leu	Gln	Arg	
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cag	ttc	cac	gtc	tac	cag	ctc	cag	cag	ctg	gat	cag	gaa	ctc	cta	4079
Gln	Phe	His	Val	Tyr	Gln	Leu	Gln	Gln	Leu	Asp	Gln	Glu	Leu	Leu	
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Ser	Gly	Lys	Glu	His	Lys	Ser	Glu	Lys	Glu	Glu	Glu	Ala	Gly	Ala	
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gca	gca	gtg	gtg	gat	gtg	gcg	gag	gga	gag	gag	gaa	gag	gag	gag	4214
Ala	Ala	Val	Val	Asp	Val	Ala	Glu	Gly	Glu	Glu	Glu	Glu	Glu	Glu	
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Asn	Glu	Asp	Leu	Tyr	Tyr	Glu	Gly	Ala	Met	Pro	Glu	Val	Ser	Val	
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ctt	gtc	ctg	tcc	cga	cac	tcc	tgg	cct	gtt	gcc	tca	atc	tgc	cac	4304
Leu	Val	Leu	Ser	Arg	His	Ser	Trp	Pro	Val	Ala	Ser	Ile	Cys	His	
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Thr	Leu	Asn	Pro	Arg	Thr	Cys	Leu	Pro	Ser	Tyr	Leu	Arg	Gly	Thr	
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ttg	aac	aga	tac	tcc	aac	ttc	tac	aac	aag	agt	cag	agc	cac	cct	4394
Leu	Asn	Arg	Tyr	Ser	Asn	Phe	Tyr	Asn	Lys	Ser	Gln	Ser	His	Pro	
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Ala	Leu	Glu	Arg	Gly	Ser	Gln	Arg	Arg	Leu	Gln	Trp	Thr	Trp	Leu	
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ggc	tgg	gct	gag	ctg	cag	ttt	ggg	aac	cag	acc	ctg	cat	gtg	tcc	4484
Gly	Trp	Ala	Glu	Leu	Gln	Phe	Gly	Asn	Gln	Thr	Leu	His	Val	Ser	
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acc	gtg	cag	atg	tgg	cta	ctg	ctg	tat	ctc	aac	gac	ctg	aag	gcg	4529
Thr	Val	Gln	Met	Trp	Leu	Leu	Leu	Tyr	Leu	Asn	Asp	Leu	Lys	Ala	
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gtc	tct	gtg	gag	agt	ctg	ctg	gcg	ttc	tca	ggg	ctc	tcc	gca	gac	4574
Val	Ser	Val	Glu	Ser	Leu	Leu	Ala	Phe	Ser	Gly	Leu	Ser	Ala	Asp	
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atg	ctc	aat	cag	gcg	att	ggg	ccc	ctc	acc	tct	tca	aga	ggc	ccc	4619
Met	Leu	Asn	Gln	Ala	Ile	Gly	Pro	Leu	Thr	Ser	Ser	Arg	Gly	Pro	
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Leu	Asp	Leu	His	Glu	Gln	Lys	Asp	Ile	Pro	Gly	Gly	Val	Leu	Lys	
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Ile Arg Asp Gly Ser Lys Glu Pro Arg Ser Arg Trp Asp Ile Val	
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Arg Leu Ile Pro Pro Gln Thr Tyr Leu Gln Ala Glu Gly Glu Asp	
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ggc cag aac ttg gag aag aga cgg aat ctt ctg aac tgc ctc atc	4799
Gly Gln Asn Leu Glu Lys Arg Arg Asn Leu Leu Asn Cys Leu Ile	
1560 1565 1570	
gtc cga atc ctc aag gcc cat gga gat gag ggg ctg cac att gac	4844
Val Arg Ile Leu Lys Ala His Gly Asp Glu Gly Leu His Ile Asp	
1575 1580 1585	
cag ctt gtc tgt ctg gtg ctg gag gct tgg cag aag ggc ccg tgt	4889
Gln Leu Val Cys Leu Val Leu Glu Ala Trp Gln Lys Gly Pro Cys	
1590 1595 1600	
cct ccc agg ggt ttg gtc agc agc ctt ggt aag ggg tct gca tgc	4934
Pro Pro Arg Gly Leu Val Ser Ser Leu Gly Lys Gly Ser Ala Cys	
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agc agc act gac gtc ctc tcc tgc atc cta cac ctc ctg ggc aag	4979
Ser Ser Thr Asp Val Leu Ser Cys Ile Leu His Leu Leu Gly Lys	
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ggc acg ctg aga cgc cat gac gac cgg ccc cag gtg ctg tcc tat	5024
Gly Thr Leu Arg Arg His Asp Asp Arg Pro Gln Val Leu Ser Tyr	
1635 1640 1645	
gca gtc cct gtg act gtc atg gag cct cac act gag tcc ctg aac	5069
Ala Val Pro Val Thr Val Met Glu Pro His Thr Glu Ser Leu Asn	
1650 1655 1660	
cca ggc tcc tca ggc ccc aac cca ccc ctc acc ttc cat acc cta	5114
Pro Gly Ser Ser Gly Pro Asn Pro Pro Leu Thr Phe His Thr Leu	
1665 1670 1675	
cag att cgc tcc cgg ggt gtg ccc tat gcc tcc tgc act gcc acc	5159
Gln Ile Arg Ser Arg Gly Val Pro Tyr Ala Ser Cys Thr Ala Thr	
1680 1685 1690	
cag agc ttc tct acc ttc cgg tag ccctagactt ggggtcaggg gaaggtagag	5213
Gln Ser Phe Ser Thr Phe Arg	
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Gly Leu His Ala Tyr Pro Asp Glu Leu Ile Arg Gln Arg Val Gly His  
 Page 22

20

25

30

Asp Gly His Pro Glu Tyr Gln Ile Arg Trp Leu Ile Leu Arg Arg Gly  
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Asp Glu Gly Asp Gly Gly Ser Gly Gln Val Asp Cys Lys Ala Glu His  
       50                                  55                                  60

Ile Leu Leu Trp Met Ser Lys Asp Glu Ile Tyr Ala Asn Cys His Lys  
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Met Leu Gly Glu Asp Gly Gln Val Ile Gly Pro Ser Gln Glu Ser Ala  
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Gly Glu Val Gly Ala Leu Asp Lys Ser Val Leu Glu Glu Met Glu Thr  
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Asp Val Lys Ser Leu Ile Gln Arg Ala Leu Arg Gln Leu Glu Glu Cys  
           115                                  120                                  125

Val Gly Thr Ile Pro Pro Ala Pro Leu Leu His Thr Val His Val Leu  
       130                                  135                                  140

Ser Ala Tyr Ala Ser Ile Glu Pro Leu Thr Gly Val Phe Lys Asp Pro  
   145                                  150                                  155                                  160

Arg Val Leu Asp Leu Leu Met His Met Leu Ser Ser Pro Asp Tyr Gln  
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Ile Arg Trp Ser Ala Gly Arg Met Ile Gln Ala Leu Ser Ser His Asp  
       180                                  185                                  190

Ala Gly Thr Arg Thr Gln Ile Leu Leu Ser Leu Ser Gln Gln Glu Ala  
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Ile Glu Lys His Leu Asp Phe Asp Ser Arg Cys Ala Leu Leu Ala Leu  
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Phe Ala Gln Ala Thr Leu Ser Glu His Pro Met Ser Phe Glu Gly Ile  
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Gln Leu Pro Gln Val Pro Gly Arg Val Leu Phe Ser Leu Val Lys Arg  
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Tyr Leu His Val Thr Ser Leu Leu Asp Gln Leu Asn Asp Ser Ala Ala  
           260                                  265                                  270

Glu Pro Gly Ala Gln Asn Thr Ser Ala Pro Glu Glu Leu Ser Gly Glu  
 275 280 285  
 Arg Gly Gln Leu Glu Leu Glu Phe Ser Met Ala Met Gly Thr Leu Ile  
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 Ser Glu Leu Val Gln Ala Met Arg Trp Asp Gln Ala Ser Asp Arg Pro  
 305 310 315 320  
 Arg Ser Ser Ala Arg Ser Pro Gly Ser Ile Phe Gln Pro Gln Leu Ala  
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 Asp Val Ser Pro Gly Leu Pro Ala Ala Gln Ala Gln Pro Ser Phe Arg  
 340 345 350  
 Arg Ser Arg Arg Phe Arg Pro Arg Ser Glu Phe Ala Ser Gly Asn Thr  
 355 360 365  
 Tyr Ala Leu Tyr Val Arg Asp Thr Leu Gln Pro Gly Met Arg Val Arg  
 370 375 380  
 Met Leu Asp Asp Tyr Glu Glu Ile Ser Ala Gly Asp Glu Gly Glu Phe  
 385 390 395 400  
 Arg Gln Ser Asn Asn Gly Val Pro Pro Val Gln Val Phe Trp Glu Ser  
 405 410 415  
 Thr Gly Arg Thr Tyr Trp Val His Trp His Met Leu Glu Ile Leu Gly  
 420 425 430  
 Phe Glu Glu Asp Ile Glu Asp Met Val Glu Ala Asp Glu Tyr Gln Gly  
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 Ala Val Ala Ser Arg Val Leu Gly Arg Ala Leu Pro Ala Trp Arg Trp  
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 Arg Pro Met Thr Glu Leu Tyr Ala Val Pro Tyr Val Leu Pro Glu Asp  
 465 470 475 480  
 Glu Asp Thr Glu Glu Cys Glu His Leu Thr Leu Ala Glu Trp Trp Glu  
 485 490 495  
 Leu Leu Phe Phe Ile Lys Lys Leu Asp Gly Pro Asp His Gln Glu Val  
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 Leu Gln Ile Leu Gln Glu Asn Leu Asp Gly Glu Ile Leu Asp Asp Glu  
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Ile Leu Ala Glu Leu Ala Val Pro Ile Glu Leu Ala Gln Asp Leu Leu  
530 535 540

Leu Thr Leu Pro Gln Arg Leu Asn Asp Ser Ala Leu Arg Asp Leu Ile  
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Asn Cys His Val Tyr Lys Lys Tyr Gly Pro Glu Ala Leu Ala Gly Asn  
565 570 575

Gln Ala Tyr Pro Ser Leu Leu Glu Ala Gln Glu Asp Val Leu Leu Leu  
580 585 590

Asp Ala Gln Ala Gln Ala Lys Asp Ser Glu Asp Ala Ala Lys Val Glu  
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Ala Lys Glu Pro Pro Ser Gln Ser Pro Asn Thr Pro Leu Gln Arg Leu  
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Val Glu Gly Tyr Gly Pro Ala Gly Lys Ile Leu Leu Asp Leu Glu Gln  
625 630 635 640

Ala Leu Ser Ser Glu Gly Thr Gln Glu Asn Lys Val Lys Pro Leu Leu  
645 650 655

Leu Gln Leu Gln Arg Gln Pro Gln Pro Phe Leu Ala Leu Met Gln Ser  
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Leu Asp Thr Pro Glu Thr Asn Arg Thr Leu His Leu Thr Val Leu Arg  
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Ile Leu Lys Gln Leu Val Asp Phe Pro Glu Ala Leu Leu Leu Pro Trp  
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His Glu Ala Val Asp Ala Cys Met Ala Cys Leu Arg Ser Pro Asn Thr  
705 710 715 720

Asp Arg Glu Val Leu Gln Glu Leu Ile Phe Phe Leu His Arg Leu Thr  
725 730 735

Ser Val Ser Arg Asp Tyr Ala Val Val Leu Asn Gln Leu Gly Ala Arg  
740 745 750

Asp Ala Ile Ser Lys Ala Leu Glu Lys His Leu Gly Lys Leu Glu Leu  
755 760 765

Ala Gln Glu Leu Arg Asp Met Val Phe Lys Cys Glu Lys His Ala His  
770 775 780

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Leu Tyr Arg Lys Leu Ile Thr Asn Ile Leu Gly Gly Cys Ile Gln Met  
785 790 795 800

Val Leu Gly Gln Ile Glu Asp His Arg Arg Thr His Arg Pro Ile Asn  
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Ile Pro Phe Phe Asp Val Phe Leu Arg Tyr Leu Cys Gln Gly Ser Ser  
820 825 830

Val Glu Val Lys Glu Asp Lys Cys Trp Glu Lys Val Glu Val Ser Ser  
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Asn Pro His Arg Ala Ser Lys Leu Thr Asp His Asn Pro Lys Thr Tyr  
850 855 860

Trp Glu Ser Asn Gly Ser Ala Gly Ser His Tyr Ile Thr Leu His Met  
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Arg Arg Gly Ile Leu Ile Arg Gln Leu Thr Leu Leu Val Ala Ser Glu  
885 890 895

Asp Ser Ser Tyr Met Pro Ala Arg Val Val Val Cys Gly Gly Asp Ser  
900 905 910

Thr Ser Ser Leu His Thr Glu Leu Asn Ser Val Asn Val Met Pro Ser  
915 920 925

Ala Ser Arg Val Ile Leu Leu Glu Asn Leu Thr Arg Phe Trp Pro Ile  
930 935 940

Ile Gln Ile Arg Ile Lys Arg Cys Gln Gln Gly Gly Ile Asp Thr Arg  
945 950 955 960

Ile Arg Gly Leu Glu Ile Leu Gly Pro Lys Pro Thr Phe Trp Pro Val  
965 970 975

Phe Arg Glu Gln Leu Cys Arg His Thr Arg Leu Phe Tyr Met Val Arg  
980 985 990

Ala Gln Ala Trp Ser Gln Asp Met Ala Glu Asp Arg Arg Ser Leu Leu  
995 1000 1005

His Leu Ser Ser Arg Leu Asn Gly Ala Leu Arg Gln Glu Gln Asn  
1010 1015 1020

Phe Ala Asp Arg Phe Leu Pro Asp Asp Glu Ala Ala Gln Ala Leu  
Page 26

1025							1030						
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Ile	Thr	Ser	Pro	Asp	Glu	Asp	Gly	Ile	Ser	Pro	Leu	Gly	Trp Leu
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Ser	Arg	Gly	Pro	Ala	Phe	Phe	Ser	Arg	Val	Arg	Arg	Leu	Thr His
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Leu	Leu	Val	His	Val	Glu	Pro	Cys	Glu	Ala	Pro	Pro	Pro	Val Val
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Ala	Thr	Pro	Arg	Pro	Lys	Gly	Arg	Asn	Arg	Ser	His	Asp	Trp Ser
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Ser	Leu	Ala	Thr	Arg	Gly	Leu	Pro	Ser	Ser	Ile	Met	Arg	Asn Leu
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Thr	Arg	Cys	Trp	Arg	Ala	Val	Val	Glu	Lys	Gln	Val	Asn	Asn Phe
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Pro	Arg	Ala	Ala	Phe	Leu	Leu	Ala	Leu	Gln	Asn	Gly	Cys	Ala Gly
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Ala	Leu	Leu	Lys	Leu	Pro	Phe	Leu	Lys	Ala	Ala	His	Val	Ser Glu
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Gln	Phe	Ala	Arg	His	Ile	Asp	Gln	Gln	Ile	Gln	Gly	Ser	Arg Ile
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Gly	Gly	Ala	Gln	Glu	Met	Glu	Arg	Leu	Ala	Gln	Leu	Gln	Gln Cys
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 Ser Thr Ser Lys Glu Leu Gln Arg Gln Phe His Val Tyr Gln Leu  
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 Gln Gln Leu Asp Gln Glu Leu Leu Lys Leu Glu Asp Thr Glu Lys  
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 Lys Ile Gln Val Gly Leu Gly Ala Ser Gly Lys Glu His Lys Ser  
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 Glu Lys Glu Glu Glu Ala Gly Ala Ala Ala Val Val Asp Val Ala  
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 Glu Gly Glu Glu Glu Glu Glu Glu Asn Glu Asp Leu Tyr Tyr Glu  
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 Gly Ala Met Pro Glu Val Ser Val Leu Val Leu Ser Arg His Ser  
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 Trp Pro Val Ala Ser Ile Cys His Thr Leu Asn Pro Arg Thr Cys  
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 Tyr Asn Lys Ser Gln Ser His Pro Ala Leu Glu Arg Gly Ser Gln  
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 Arg Arg Leu Gln Trp Thr Trp Leu Gly Trp Ala Glu Leu Gln Phe  
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 Gly Asn Gln Thr Leu His Val Ser Thr Val Gln Met Trp Leu Leu  
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 Leu Tyr Leu Asn Asp Leu Lys Ala Val Ser Val Glu Ser Leu Leu  
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 Ala Phe Ser Gly Leu Ser Ala Asp Met Leu Asn Gln Ala Ile Gly  
 1490 1495 1500

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Asp Ile Pro Gly Gly Val Leu Lys Ile Arg Asp Gly Ser Lys Glu  
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Pro Arg Ser Arg Trp Asp Ile Val Arg Leu Ile Pro Pro Gln Thr  
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Tyr Leu Gln Ala Glu Gly Glu Asp Gly Gln Asn Leu Glu Lys Arg  
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Arg Asn Leu Leu Asn Cys Leu Ile Val Arg Ile Leu Lys Ala His  
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Gly Asp Glu Gly Leu His Ile Asp Gln Leu Val Cys Leu Val Leu  
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Glu Ala Trp Gln Lys Gly Pro Cys Pro Pro Arg Gly Leu Val Ser  
1595 1600 1605

Ser Leu Gly Lys Gly Ser Ala Cys Ser Ser Thr Asp Val Leu Ser  
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Cys Ile Leu His Leu Leu Gly Lys Gly Thr Leu Arg Arg His Asp  
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Asp Arg Pro Gln Val Leu Ser Tyr Ala Val Pro Val Thr Val Met  
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Glu Pro His Thr Glu Ser Leu Asn Pro Gly Ser Ser Gly Pro Asn  
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Pro Pro Leu Thr Phe His Thr Leu Gln Ile Arg Ser Arg Gly Val  
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 <211> 7  
 <212> PRT  
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<400> 10

Leu Ala Cys Ile Gly Asp Glu  
 1 5

<210> 11  
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<400> 11

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Leu Ala Ala Met Cys Asp Asp  
1 5

<210> 12  
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<213> mus musculus

<400> 12

Leu Arg Arg Met Ser Asp Glu  
1 5

<210> 13  
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<400> 13

Leu Lys Lys Asn Ser Asp Trp  
1 5